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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
ADDIE, RAYMOND W	

ART UNIT	PAPER NUMBER
3671	

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/481,351	PAYNE ET AL.	
	Examiner	Art Unit	
	Raymond W. Addie	3671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06/01/04*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *25,57-70 and 76-78* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *25,57-70 and 76-78* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to.a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 76 -78 are rejected under 35 U.S.C. 102(e) as being anticipated by Alft # 6,308,787 B1.

Alft discloses a method for using a horizontal drilling machine having a plurality of automated functions, the machine comprising a drill string to which an underground tool is attached. The method comprising:

Selecting a path along which the underground tool is to be used.

Axially advancing the drill string so as to move the underground tool along at least a portion of the selected path, while automatically operating at least one of the plurality of automated functions of the drilling machine.

Automatically controlling power used by the drilling machine, by;

Sensing a speed of an engine, detecting an input to a thrust circuit used to advance the drill string.

Detecting an input to a rotation circuit used to rotate the drill string.

Detecting an input to a fluid dispensing assembly and used to supply fluid during a boring operation.

Setting the engine speed to a desired speed and/or torque dependent upon operational requirements.

Wherein the underground tool can be advanced in a particular direction by automatically rotating and/or thrusting the drill string.

Further, Alft does specifically recite advancing the drill string until the drill string must be lengthened, it is inherent from the disclosure of Alft, that the drill string cannot be further advanced until the rotation motor (19) automatically threads a new drill string member (23) to the up hole end of the drill string (22). See Col. 13, Ins. 5-20; col. 30, col. 40, 43.

In regards to Claims 77-78 Alft discloses automatically controlling the supply of fluid to the underground tool by maintaining fluid flow at a predetermined flow rate when drill string is being advanced, a fluid pressure and a measured flow rate is at or above a predetermined rate, as well as activating and deactivating fluid jets to introduce/change the type/change the viscosity/change the temperature of a cutting fluid, in real time, dependent upon operational requirements. See Col. 10, Ins. 34-61; Col. 12, Ins. 53-col 13, In. 43; col. 18, Ins. 35-col. 19. In. 39.

Alft further discloses the steps of:

Automatically rotating and thrusting the drill string forward or backward, as well as rotating the drill string to a desired roll orientation; until a change of direction is required or the drill string must be lengthened or shortened.

Alft further discloses a method of locating an drill head comprising:

Sensing a roll position of the underground tool.

Sensing a pitch of the underground tool.

Sensing an orientation of the underground tool.

Sensing a temperature of the underground tool.

Calculating the position of the underground tool.

See Figs. 3A-3E; col. 5, lns. 1-30; Col. 16, lns. 15-60.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 25, 57-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alft # 6,308,787 B1.

Alft discloses a horizontal drilling system comprising:

A horizontal drilling machine (12).

A drill string (22).

A drive system (17, 19) operatively connectable to a 1st end of the drill string. Said drive system being adapted to advance the drill string through the earth.

A down hole tool (24) connectable to a 2nd end of the drill string.

A pipe handling assembly adapted to extend and reduce the length of the drill string by automatically adding or subtracting a drill string member (23).

See Cols. 12-13.

A fluid dispensing assembly adapted to deliver fluid, such as mud and water, to the down hole tool (24).

A machine control system (25) adapted to operate the drilling machine.

Said control system comprising:

A plurality of sensors (27, 152, 162, 167, 168, 189, 195, 198). Each sensor adapted to sense data relative to at least one of a plurality of parameters defining the operation or environment of the drilling machine.

A main control circuit (72, 74), see col. 13, lns. 45-58, adapted to receive data from the plurality of sensors and automatically operate the drilling machine in response to the data.

Wherein at least one of the plurality of automated functions is selected from the group comprising a pipe handling function, a power management function, a guidance control function, a fluid control function and a tracking function.

See col. 12, ln. 53-Col. 13, ln. 20; Col. 15, lns. 25-39; Col. 16, lns 45-53

A rotation circuit input sensor adapted to monitor input to the drive system and transmit a rotation input signal. See col. 16, lns. 45-53.

A fluid circuit input sensor adapted to monitor input to the fluid dispensing assembly and transmit a fluid input signal. See col. 18, lns. 48-50.

Wherein, when the plurality of automated functions comprises the guidance control function; the plurality of sensors comprises a thrust output sensor adapted to monitor thrust applied to the drill string and transmit a thrust output signal. A rotation circuit sensor adapted to monitor rotation applied to the drill string and transmit a rotation output signal. A carriage position sensor adapted to monitor a relative position of a (thrust/pullback) carriage (19). and transmit a carriage position signal.

Wherein, when the plurality of automated functions comprises the fluid control function, the plurality of sensors comprises an operating sensor adapted to transmit an operating signal when the fluid dispensing system is required to be operational.

A flow rate sensor adapted to monitor the rate of flow from the fluid dispensing system and transmit a flow rate signal. A fluid pressure sensor adapted to monitor the output of the fluid dispensing system and transmit a fluid pressure signal and a flow sensor adapted to detect presence of fluid flow and transmit a fluid flow signal.

Wherein, when the plurality of automated functions comprises the tracking function; the plurality of sensors comprises roll, pitch and azimuth sensors, each adapted to detect

and transmit a roll, pitch and azimuth orientation signal respectively, of the down hole tool (24). A temperature sensor adapted to detect a temperature at the down hole tool and transmit a temperature signal.

Although Alft does not specifically recite individual sensors for each automated function, Alft clearly discloses each automated function is performed in "réal-time" and transmits data regarding each of the automated functions to a central processor (25); in order to permit "real time" safety oriented control, to change a particular boring machine or boring tool operation given the dynamics of a given applications.

See Col. 16, lns. 45-61. See also Col. 3, lines 5-20, Col. 12, lines 24-col. 13, line 43; col. 14, lines 48-60, col. 15, lines 5-25, col. 18, lines 35-col. 19, line 55, col. 27, lines 16-43, Cols. 37-42 in their entirety.

In regards to Claims 57-59 Alft discloses the drive system further comprises a thrust circuit adapted to thrust the drill string and a rotation circuit adapted to rotate the drill string. Wherein, when the plurality of automated functions comprises a power management function, the plurality of sensors comprises an engine (169) speed monitor (72) adapted to detect an operating speed of an engine/motor/pump and transmit and an engine output signal (Cs). See col. 18, lns. 45-48; Col. 40, emphasis in lns 59-67.

A thrust circuit input sensor adapted to monitor input to the drive system and transmit a thrust input signal such that the main control circuit (74, 72) is further adapted to control engine performance and operation at all operating speeds, based on signals from various geophysical and machine operating sensors to include engine control signals (Cs) from the central processor (72). See col. 40, 43.

In regards to Claim 60 Alft discloses when the plurality of automated functions comprises the power management function, the plurality of sensors further comprises:

A thrust circuit output sensor adapted to monitor an output of the thrust circuit and transmit a thrust output signal.

A rotation circuit output sensor adapted to monitor an output of the rotation circuit and transmit a rotation output signal.

A fluid circuit output sensor adapted to monitor an output of the fluid dispensing assembly and transmit a fluid output signal.

Wherein, the main control circuit is adapted to regulate output of the engine in response to the engine output signal, the thrust input signal, the rotation input signal, the fluid input signal, the thrust output signal, the rotation output signal and the fluid output signal to automatically operate the power management function. See Cols. 39-40.

In regards to Claims 63, 64, 71 Alft discloses the main control circuit (74) is further adapted to automatically operate the guidance function and a tracking function when the down hole tool is to be advanced in a particular direction by operating the drive system to rotate and/or thrust, the drill string to a desired orientation (to include roll position signals, orientation signals, pitch and yaw signals) indicating a change of direction is required or the drill string must be lengthened. See Col. 30, 39-40, col. 42.

In regards to Claim 65 Alft discloses when the plurality of automated functions comprises the guidance function, the plurality of sensors further comprises:

A rotation circuit speed sensor, adapted to monitor to monitor a rotational speed of the drill string and transmit a rotational speed signal.

A product tension sensor adapted to detect a tension/stress/pressure at the down hole tool and transmit a product tension signal.

Wherein the main control circuit is adapted to operate the drive system in response to the thrust output signal, the rotation output signal, the carriage position signal, the rotational speed signal and the product tension signal to automatically operate the guidance control function. See Col. 40, 43.

In regards to Claim 66, Alft discloses the main control circuit is further adapted to automatically operate the guidance function when the down hole tool is used in a back reaming operation, by operating the drive system to rotate and pullback the drill

string until the drill string must be shortened by unthreading a drill string member (230 from the drill string. See col. 30, Ins. 19-37.

In regards to Claims 67, 68 Alft discloses the main control circuit (74) is further adapted to control a rate of pullback in response to a variety of sensor signals, such as generated by sensors (152, 162). See col. 40. Ins. 16-27; col. 43.

In regards to Claims 69 Alft discloses the main control circuit is further adapted to automatically operate the fluid control function by operating the fluid dispensing assembly to stop or maintain fluid flow at a predetermined flow rate when operating sensors indicate fluid is required, a fluid pressure is at a predetermined limit and/or a flow rate is above a predetermined rate.
It should be noted that Alft further discloses controlling the viscosity and composition of the fluid based on sensor signals representing a variety of geophysical and machine operating characteristics. See col. 5, Ins. 3-31.

Response to Arguments

3. Applicant's arguments filed 06/01/2004 have been fully considered but they are not persuasive.

Applicant argues against the reference to Alft, by stating "Nowhere...does Alft describe or suggest axially advancing the drill string so as to move the underground tool along at least a portion of the selected path unitl a change of direction is required, while automatically operating at least one f the plurality of automated functions as claimed in Applicants' claim 76".

However, the Examiner does not concur.

Alft explicitly discloses in col. 30, lns. 19-65 that the main control circuit (74/72) automatically controls operation of the guidance control function by operating the drive system (144, 146) in response to the thrust output signal (152), the rotation output signal (162) until a change of direction is required for the downhole tool. See also cols. 31-32. Alft further discloses the main control circuit further automatically controls operation of the guidance control function by operating the drive system (144, 146) in response to carriage position sensor signals as provided by carriage position sensor (83), which relate a monitored, relative position of a carriage (81) to the main control circuit (72, 74). See col. 29, ln. 1-col. 30, ln. 7; col. 38, lns. 1-21; col. 40.

Therefore, the argument is not persuasive and the rejection is upheld.

Applicant then argues "Alft does not discloses, for example that when the tracking function of the machine is automatically operated, the main control circuit is adapted to calculate a position of the down-hole tool in response to the roll position signal, the pitch signal, the orientation signal and the temperature signal...

Instead, Alft merely suggests that other data concerning the operation of the machine may be obtained. Alft does not adequately describe which or how any information would be used in a tracking function".

However, the Examiner does not concur.

Alft explicitly discloses "
(16) The boring tool down-hole sensor unit may also include one or more temperature sensors which sense the ambient temperature within the boring tool housing and/or each of the down-hole sensors and associated circuits. Using several temperature sensors provides for the computation of an average ambient temperature and/or average sensor temperature. The temperature data acquired using the temperature sensors may be used to compensate for temperature related accuracy deviations that affect a given down-hole sensor. Detection of an appreciable change in temperature, such as an appreciable increase in boring tool temperature, for example, may result in an increase in the sampling/acquisition rate of data obtained from the various down-hole sensor data in order to better characterize and compensate for temperature related affects on the acquired data.
See Col. 10, lns. 1-61.

Further Alft discloses "The controller determines a location of the boring tool with reference to a known initial location, such as a known entry point at which the boring tool initially penetrates the earth's surface. The entry location is preferably defined in terms of x-, y-, and z-plane coordinates, or, alternatively, in terms of latitude, longitude, and elevation. The controller determines the location of the boring tool using the boring tool telemetry data received from the down-hole sensor unit and/or the tracker unit. In accordance with one embodiment, the controller determines the boring tool location using a successive approximation approach, by which the change of boring tool position is based on the displacement of the drill string and the telemetry data received from the down-hole sensor unit and/or tracker unit. The location of the boring tool may be expressed in terms of position (e.g., x-, y-, z- plane coordinates) and/or orientation (e.g., pitch (up/down) and yaw (left/right))...

The tracker unit may receive an electromagnetic or acoustic signal from the boring tool. In one embodiment, the tracker unit comprises a ground penetrating radar (GPR) unit. According to this embodiment, the boring tool includes a receiver and a signal processing device. The boring tool receiver receives a probe signal transmitted by the GPR unit, and the signal processing device generates a boring tool signal in response to the probe signal. The boring signal according to this embodiment has a characteristic that differs from the probe signal in one of timing, frequency content, information content, or polarization"; See col. 3, ln. 60-Col. 4, ln. 20.

Therefore the argument is not persuasive and the rejection is upheld.

Applicant the argues "Alft does not adequately describe the machine controller when the pipe handling function of the machine is automatically operated...Alft merely suggests that the controller could be used to add a length of pipe onto a drill string with an automatic rod loader...the loaders suggested for use with the Alft invention are mechanical devices with no automatic control described, and the Alft disclosure does not describe or suggest how the operations of a loader may be controlled by the machine. Applicants' invention...on the other hand, incorporates by reference a copending...application that describes the sensors and inputs required and functionality of the main control circuit to automatically operate the pipe handling assembly...Alft does not describe...how the machine controller would automatically control the pipe handling function".

However the Examiner does not concur.

The cited claim language as recited in claim 25 recites "a pipe handling assembly adapted to extend and reduce the length of the drill string...wherein at least one of the plurality of automated functions is selected from the group comprising a pipe handling function".

The dependent claims do not appear to add any additional limitations directed toward the pipe handling function(s).

To that extent Alft discloses " As is best shown in FIG. 7, the machine controller 74 controls a rotation pump or motor 146, referred to hereinafter as a rotation pump, that rotates the drill string during a boring operation. The machine controller 74 also controls the rotation pump 146 during automatic threading of rods to the drill string. A pipe loading controller 141 may be employed to control an automatic rod loader apparatus during rod threading and unthreading operations...
(104) The machine controller 74 also controls rotation pump movement when threading a length of pipe onto a drill string 180, such as by use of an automatic rod loader apparatus of the type disclosed in commonly assigned U.S. Pat. No. 5,556,253, which is hereby incorporated herein by reference in its entirety. An engine or motor (not shown) provides power, typically in the form of pressure, to both the thrust/pullback pump 144 and the rotation pump 146, although each of the pumps 144 and 146 may be powered by separate engines or motors.
Hence, it can be clearly seen that Alft explicitly discloses the use of a "pipe loading controller (141) may be employed to control an automatic rod loader apparatus during (un)threading of the drill string. See col. 30, lns. 19-55.

Therefore, the argument is not persuasive and the rejection is upheld.

Applicant then suggests "Claims 57-70 are dependent claims...depend from claim 25...these claims are also allowable over Alft".

Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

Conclusion

4. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond W. Addie whose telephone number is 703 305-0135. The examiner can normally be reached on 8-2, 6-8.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas B. Will can be reached on 703 308-3870. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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RWA
9/28/2004